

Remarks

These Remarks are responsive to the Office Action dated November 19, 2010. Claims 1–13 remain pending.

Claim Rejections under 35 U.S.C. § 103(a)

In the Office Action, claims 1–3 and 11–13 were rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Deloche et al. (US 6,030,431, hereinafter “Deloche”) in view of Galperin et al. (US 5,417,740, hereinafter “Galperin”). In addition, claim 4 was rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Deloche and Galperin in further view of JP 01219116; claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Deloche and Galperin and further in view of Kundrat et al. (US 5,702,502, hereinafter “Kundrat”) and Hirai et al. (US 4,334,921, hereinafter “Hirai”); claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Deloche and Galperin in further view of Stercho (US 2002/0088102); and claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Deloche and Galperin and further in view of Hikosaka et al. (US 4,908,059, hereinafter “Hikosaka”).

Applicant respectfully traverses the rejections. The applied references fail to disclose or suggest the features defined by the claims, and there would have been no apparent reason for modification to arrive at the claimed features.

For example, the applied references fail to disclose or suggest all the features of independent claim 1. Independent claim 1 is directed toward a process for improving energy supply when heating and melting a scrap bulk within a vessel having side and top walls. According to the claim, preheated oxidizing gas with addition of fossil fuels melts a channel into a scrap bulk, and further energy supply occurs through the channel. The claim specifies that the hot blast is supplied to the scrap bulk from the top wall of the vessel.

In support of the rejection of independent claim 1, the Office Action acknowledged that Deloche does not disclose a vessel having side and top walls and feeding hot blast to scrap bulk from the top wall of the vessel.¹ However, the Office Action cited Galperin in an attempt to overcome this deficiency.² The Office Action asserted that Galperin discloses “blowing oxygen

¹ Office Action dated November 19, 2010, at page 3.

² *Id.*

rich oxidizing gas from movable top lancing and charging the slag forming materials, coal, and additional carbon materials . . . , which reads on the wall structure and feeding hot blast from the top wall as recited in the instant claim.”³ The Office Action further asserted that it would have been obvious to modify Deloche in view of Galperin because Galperin “teaches that: ‘. . . in order to provide for high productivity and efficiency in of steelmaking . . . it is important to protect the solid material from excessive oxidation during the entire melting down cycle.”⁴ Applicant respectfully disagrees.

Deloche is directed toward a method of improving energy input in heating and melting of scrap bulk.⁵ In one example, Deloche describes that the method involves burning a channel into scrap bulk by means of a hot, oxygen-containing gas.⁶ Contrary to the requirements of independent claim 1, however, which recites supplying hot blast to a scrap bulk from a top wall of a vessel, Deloche describes gas that is injected into scrap bulk using nozzles positioned in the “upper area of the side walls” of an electric arc furnace.⁷

The Office Action cited Galperin in an attempt to overcome the deficiencies in Deloche. Galperin is directed toward a method of steelmaking in a partially refractory lined furnace.⁸ According to Galperin, a problem with some steel making processes is that oxidizing gas introduced near the bottom of a furnace to combust auxiliary fuels triggers competing chemical reactions that oxidize molten materials.⁹ Galperin claims that these competing chemical reactions consume oxygen that is intended to be combusted with the auxiliary fuel, negatively affecting the efficiency of the steel making process.¹⁰ To overcome these problems, Galperin proposes a method that “utilizes a solid ferrous metallic material charge” “in combination with a liquid metallic charge.”¹¹ Galperin further explains that heat for the process “is essentially supplied by the heat of liquid metallic material charge and the heat that has been generated by burning of preferably two different types of solid carbonaceous fuels strategically charges in

³ *Id.*

⁴ *Id.*

⁵ *See* Deloche at Abstract.

⁶ *See id.* at col. 1, ll. 65–67.

⁷ *See id.* at col. 3, ll. 38–43.

⁸ *See* Galperin at Abstract.

⁹ *See id.* at col. 3, ll. 58–62.

¹⁰ *See id.* at col. 3, ll. 58–66.

¹¹ *See id.* at col. 5, ll. 10–16.

time and space into the furnace to provide for rapid preheating of scrap with minimal oxidation.”¹²

While Galperin further describes that the two solid carbonaceous fuels “are controllably oxidized, primarily with the use of a centrally directed top blown oxidizing gas,”¹³ Applicant respectfully disagrees that a person of ordinary skill in the art would have found it obvious to modify the position of the nozzles in Deloche in view of Galperin to arrive at the features of independent claim 1. The cited portion of Deloche describes delivering a hot, oxygen containing gas jet that includes a fossil fuel to cut a channel in scrap bulk. By contrast, the gas jet of Galperin does not include a fossil fuel to cut a channel in scrap bulk. Rather, the gas supplied by Galperin is only an oxidizing gas that reacts with fuel strategically placed in a furnace. Accordingly, because Galperin does not include a gas jet that is any way analogous to the hot gas jet of Deloche, a person of ordinary skill in the art would not have found it obvious to modify the position of the nozzles in Deloche based on the teachings of Galperin.

Moreover, Applicant submits that a person of ordinary skill in the art would not have modified Deloche in view of Galperin because Galperin does not disclose a solution to the problems of the Deloche method. As detailed in Applicant’s specification, a problem with the method of German patent DE 195 215 18 (which is a foreign counterpart to Deloche) is that the method results in hot gas jets causing an upward flow in the center of a furnace, resulting in a chimney-like effect with melted scrap bulk in the middle of the furnace and an outer ring of unmolten scrap.¹⁴ The Galperin method appears to suffer from a similar chimney-like effect. For example, Galperin describes the following effect when directing oxidizing gas into a furnace with strategically placed fuel:

Because the major amount of oxygen is directed toward said central zone 7 of the furnace, this zone receives the major fraction of heat being released by oxidation of volatilized combustibles and, therefore, has the highest temperature. The volume of the furnace occupied by metallic material outside of this central zone receives less unconsumed oxygen and, therefore, maintains more reducing and colder conditions during oxygen blowing.¹⁵

Accordingly, a person of ordinary skill in the art would not have found a solution to the technical problems of Deloche based on the description of Galperin. For this additional reason, the person

¹² *Id.* at col. 5, ll. 19–26.

¹³ *Id.* at col. 5, ll. 30–31.

¹⁴ See Applicant’s disclosure at pages 1 and 2.

¹⁵ Galperin at col. 15, ll. 36–44.

of ordinary skill in the art would not have found it obvious to modify the position of the nozzles in Deloche in view of Galperin to arrive at the features of independent claim 1.

In addition, a person of ordinary skill in the art would not have modified the position of the nozzles in Deloche in view of Galperin because Galperin relates to an entirely different type of furnace technology than Deloche. Deloche relates to a process for heating and melting scrap bulk via a hot blast that provides hot, high momentum energy to cut a channel into scrap bulk. In contrast, Galperin relates to basic oxygen furnaces and modified electric arc furnaces that supply cold oxidizing gas via a lance.¹⁶ For example, as previously described, Galperin describes a method in which carbonaceous materials are charged to a furnace prior to or while blowing oxidizing gas to supply the energy for the steel making process.¹⁷ This is a completely different process for making steel than the process for heating and melting scrap described in Deloche.

For at least the reasons given above, a person of ordinary skill in the art at the time of Applicant's invention would not have modified Deloche in view of Galperin.

Moreover, Applicant respectfully traverses the Office Action's rationale for modifying Deloche in view of Galperin. The Office Action asserted that it would have been obvious to modify Deloche in view of Galperin because Galperin "teaches that: ' . . . in order to provide for high productivity and efficiency in steelmaking processes utilizing solid ferrous metallic material and fuel consisting of hydrocarbons and solid carbon, it is important to protect the solid material from excessive oxidation during the entire melting down cycle.'"¹⁸ This is a direct quote from the disclosure of Galperin. However, the technical solution Galperin discloses to protect a solid material from excessive oxidation is not to position a hot blast stream on the top wall of the vessel. Rather, as discussed above, the solution Galperin proposes is to position solid carbonaceous fuel charges strategically in time and space into a furnace to provide for rapid preheating of scrap with minimal oxidation. Accordingly, a person of ordinary skill in the art would not have modified the position of the nozzles in Deloche in view of Galperin to "protect . . . solid material from excessive oxidation," because Galperin discloses a different technical

¹⁶ See *id.* col. 5, ll. 1–6.

¹⁷ See *e.g., id.* at col. 25, ll. 38–40.

¹⁸ Office Action dated November 19, 2010, at page 4.

solution to achieve this effect. Consequently, the Office Action's rationale for modifying Deloche in view of Galperin lacks a rational underpinning of fact.¹⁹

For at least the reasons given above, Deloche in view of Galperin does not render the features of independent claim 1 unpatentable. Further, nothing in Kundrat, Hirai, Stercho, or Hikosaka overcome the fundamental deficiencies identified above with respect to Deloche and Galperin. Reconsideration and withdrawal of the rejection are therefore respectfully requested.

Claims 2–13 depend from independent claim 1 and are therefore patentable for at least the reasons given above with respect to independent claim 1, as well as upon additional patentable features and elements claimed in the dependent claims but not explicitly discussed herein.

¹⁹ “[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418, 82 USPQ2d 1385, 1396 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)).

Conclusion

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims.

In view of the fundamental differences identified above, Applicant reserves further comment concerning the additional features set forth in the claims. However, Applicant does not acquiesce in the propriety of the Office Action's application or interpretation of the references with respect to the claims, and reserves the right to present additional arguments in any further prosecution of this application.

Please charge any additional fees or credit any overpayment to deposit account number 06-1910. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Respectfully submitted,

/Eric J. Snustad/

Eric J. Snustad
Reg. No. 45,120
(612) 492-7151

Customer No. 22859
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402-1425 USA
Telephone: (612) 492-7000
Facsimile: (612) 492-7077

Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 06-1910.

4926044_1.DOC